

Chapter 3 Existing Environment, Project Effects, and Mitigation

WSDOT is evaluating two alternatives in this EA—the No Action Alternative and the proposed action. Chapter 3 identifies the long-term effects and potential mitigation measures for the alternatives. Question 1 identifies those environmental features which would not be affected by the project. Then the chapter discusses the transportation components of the project in Questions 2 through 4. Elements of the environment that affect people are described in Questions 5 through 13, and elements that affect ecosystems are described in Questions 14 through 17. Other elements are discussed in Questions 18 through 21. Potential mitigation measures are then discussed in Question 22.

The analyses presented in this chapter, as well as Chapter 4, are based on a number of studies and discipline reports, which are incorporated by reference and listed on page R-3.

1 What environmental features are not affected by the project?

The following resources were determined to be nonexistent in the project area or have no measurable impacts in the study area and are not addressed in this EA:

- Farmlands of long-term commercial or potentially commercial significance, which could be classified as prime agricultural soils by the USDA Soil Conservation Service are not found in the project area or potential mitigation sites (Parametrix 2006).
- A Coastal Zone or Coastal Barriers are not part of the project area.

- Energy resources are not affected by the proposed action.
- Social and Economic Resources are not affected by the project. The manner in which people may otherwise be affected by the proposed action are encompassed under Transportation Effects and Effects on People sections below.
- Wild and Scenic Rivers are not designated in the project area.

Transportation Effects

2 What are the traffic conditions in the project area?

How does SR 522 operate today?

SR 522 is currently a two-lane highway with no passing allowed within the project limits. Traffic on SR 522 is generally most congested in the westbound direction during the morning commute (AM peak hour) and in the eastbound direction during the evening commute (PM peak hour). During the AM peak hour, the westbound volume between 164th Street SE and the Snohomish River Bridge is 1,110 vehicles per hour and the eastbound volume is 595 vehicles per hour. During the PM peak hour, the volume is as high as 1,065 vehicles per hour in the eastbound direction and 740 vehicles per hour in the westbound direction.

The project team conducted a capacity and level of service (LOS) analysis for SR 522 between the Snohomish River Bridge and US 2. The results of the AM and PM peak hour analysis for the existing 2005 and 2030 No Action Alternative are shown in Exhibit 3-1. The analysis of the No Action Alternative assumes that other programmed traffic improvement projects, such as the City of Monroe's proposed roundabout at Frylands Boulevard, will be implemented before 2030.

The 2030 proposed action is shown in Exhibit 3-2. SR 522 between the Snohomish River Bridge and the 164th Street SE interchange currently operates at full capacity at LOS E, while the highway between the 164th Street SE interchange and US 2

What is Level of Service?

Level of service (LOS) is a measurement of the quality of traffic operations on a given transportation facility. LOS grading ranges from A through F, similar to grading scales used in the education system, where A is the best grade and F the worst. LOS A represents a condition in which drivers would experience minimal delays. At LOS C or D, traffic typically flows reasonably well with some delays. LOS E and F indicate stop-and-go conditions with frequent delays.

| LOS | Avg. Delay Signalized (Seconds) | Avg. Delay Unsignalized (Seconds) |
|-----|---------------------------------------|---|
| A | 0-10 | 0-10 |
| B | >10-20 | >10-15 |
| C | >20-35 | >15-25 |
| D | >35-55 | >25-35 |
| E | >55-80 | >35-50 |
| F | >80 | >50 |

Source: Highway Capacity Manual (TRB 2000)

operates reasonably well at LOS D during both the AM and PM peak hours.

How do intersections in the project area operate today?

Between the Cathcart Road vicinity and US 2, access to SR 522 is limited to the interchange at 164th Street SE and the interchange at US 2. The project team evaluated traffic operations for intersections located at and near the 164th Street SE and US 2 interchanges. Exhibit 3-3 shows the existing AM and PM peak hour delays and LOS at these area intersections.

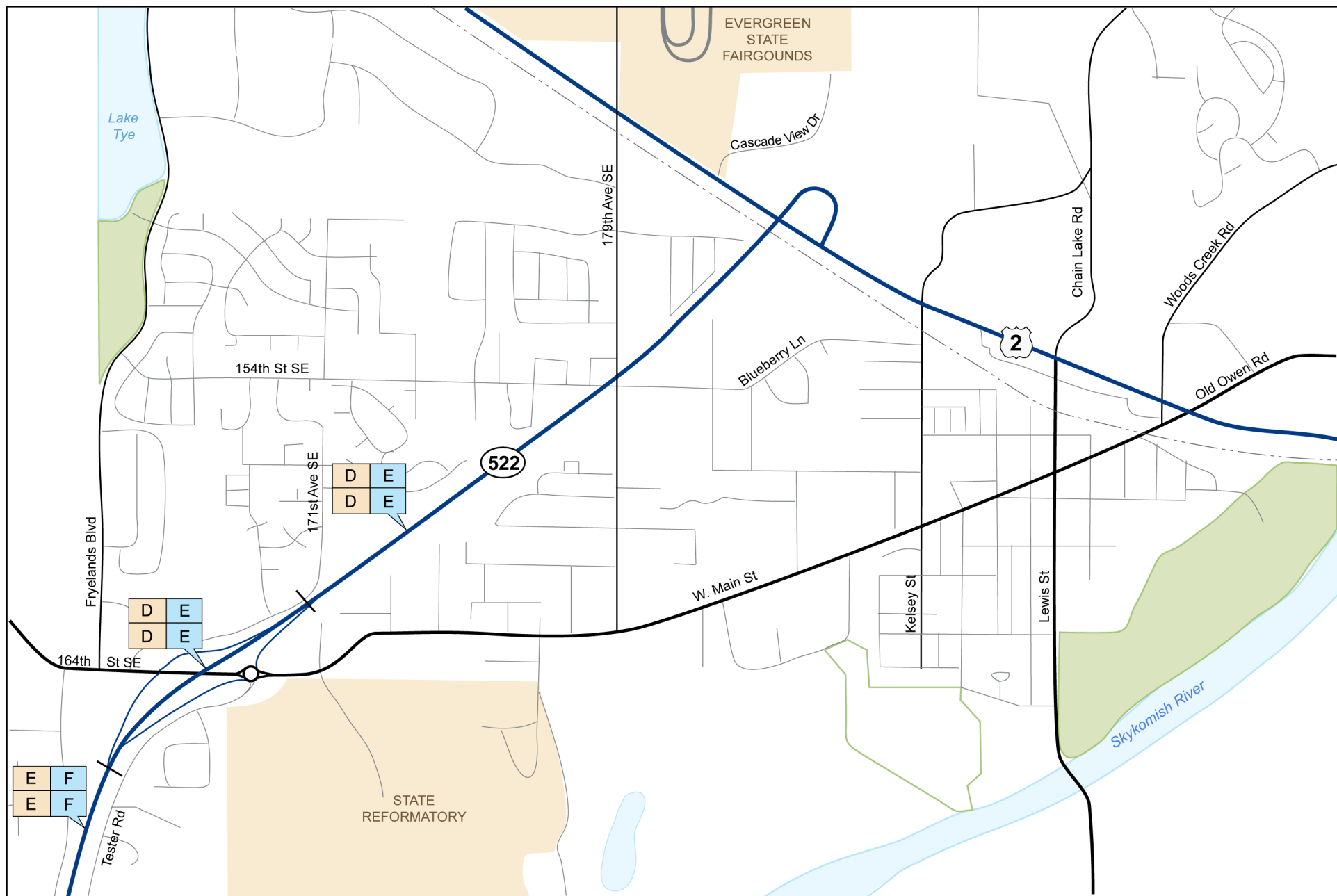
During the AM peak hour, most of the intersections analyzed operate well at LOS C or better. The only exception is at the 164th Street SE intersection with the SR 522 westbound on- and off-ramps. This intersection currently operates poorly at LOS F during the AM peak hour. Drivers on the westbound off-ramp are often caught in long queues due to high through traffic volumes on 164th Street SE and the difficulty for vehicles stopped on the ramp to make left turns.

During the PM peak hour, intersections on US 2 operate at LOS D. However, queues on US 2, particularly in the westbound direction, have become unacceptably long. The SR 522 westbound off-ramp approach to the 164th Street SE intersection operates poorly at LOS F. The intersections along 164th Street SE at Fryelands Boulevard and the SR 522 eastbound ramps operate well at LOS C or better with minimal delays.

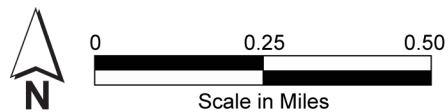
Independent of this project, Monroe is planning to construct a roundabout at 164th Street SE and Fryelands Boulevard, which will improve operations at the intersection.

What is a queue?

A queue is the line of vehicles that is waiting to move through an intersection or congestion point.



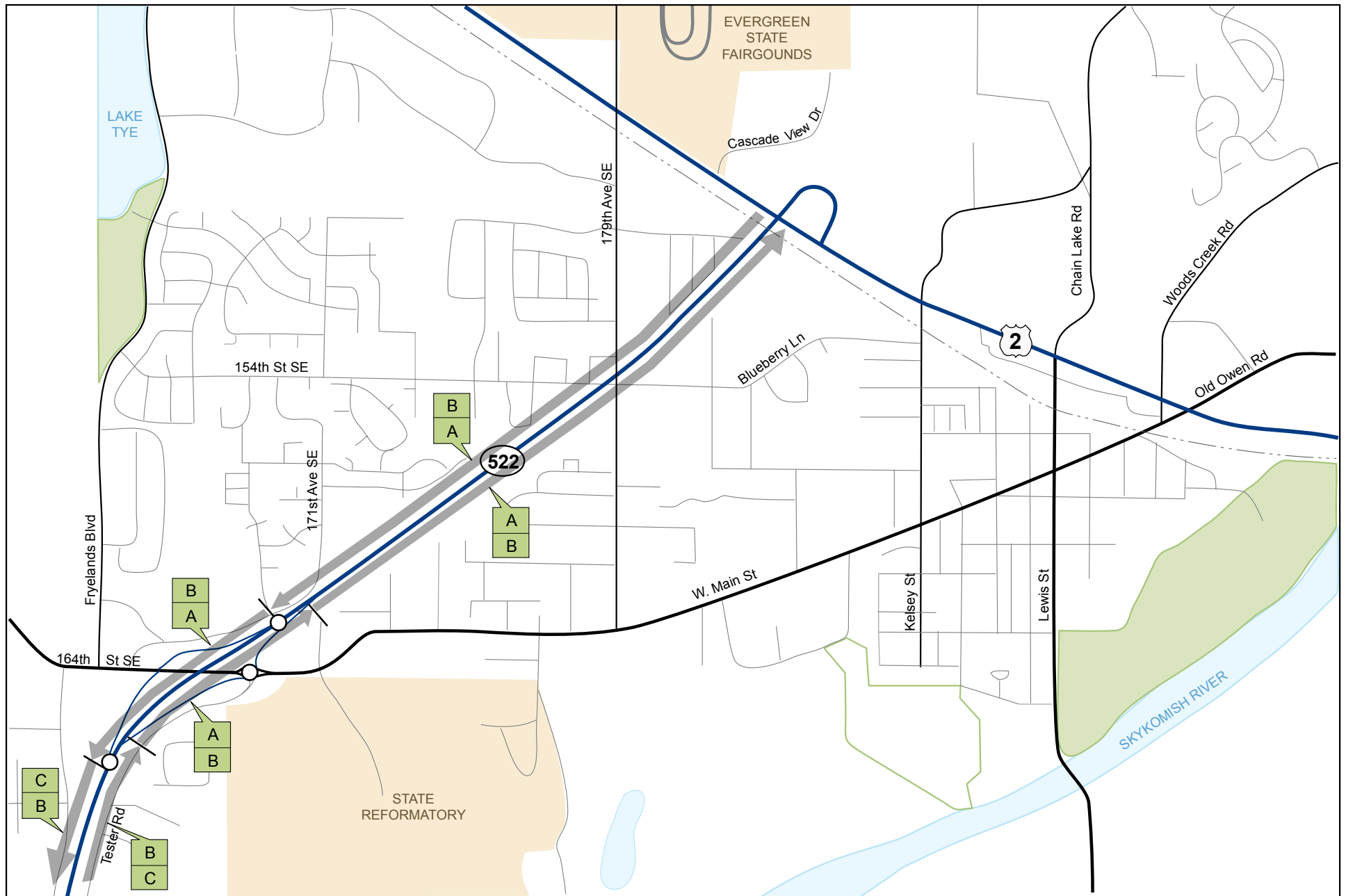
SR522 to US 2 Project 214-1631-038/03(041) 8/07 (B)



| Existing - 2005 | Without Project - 2030 |
|--------------------|------------------------------|
| D | E |
| D | E |

AM Peak Hour LOS (Average Delay in Seconds)
PM Peak Hour LOS (Average Delay in Seconds)

Exhibit 3-1
AM and PM Peak Hour Highway
LOS for Existing and 2030 No
Action Conditions



SR522 to US 2 Project 214-1631-038/03(041) 8/07 (B)

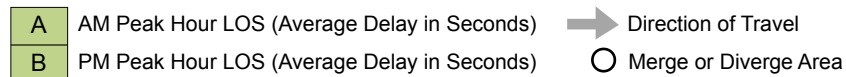
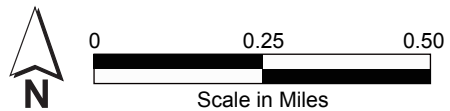
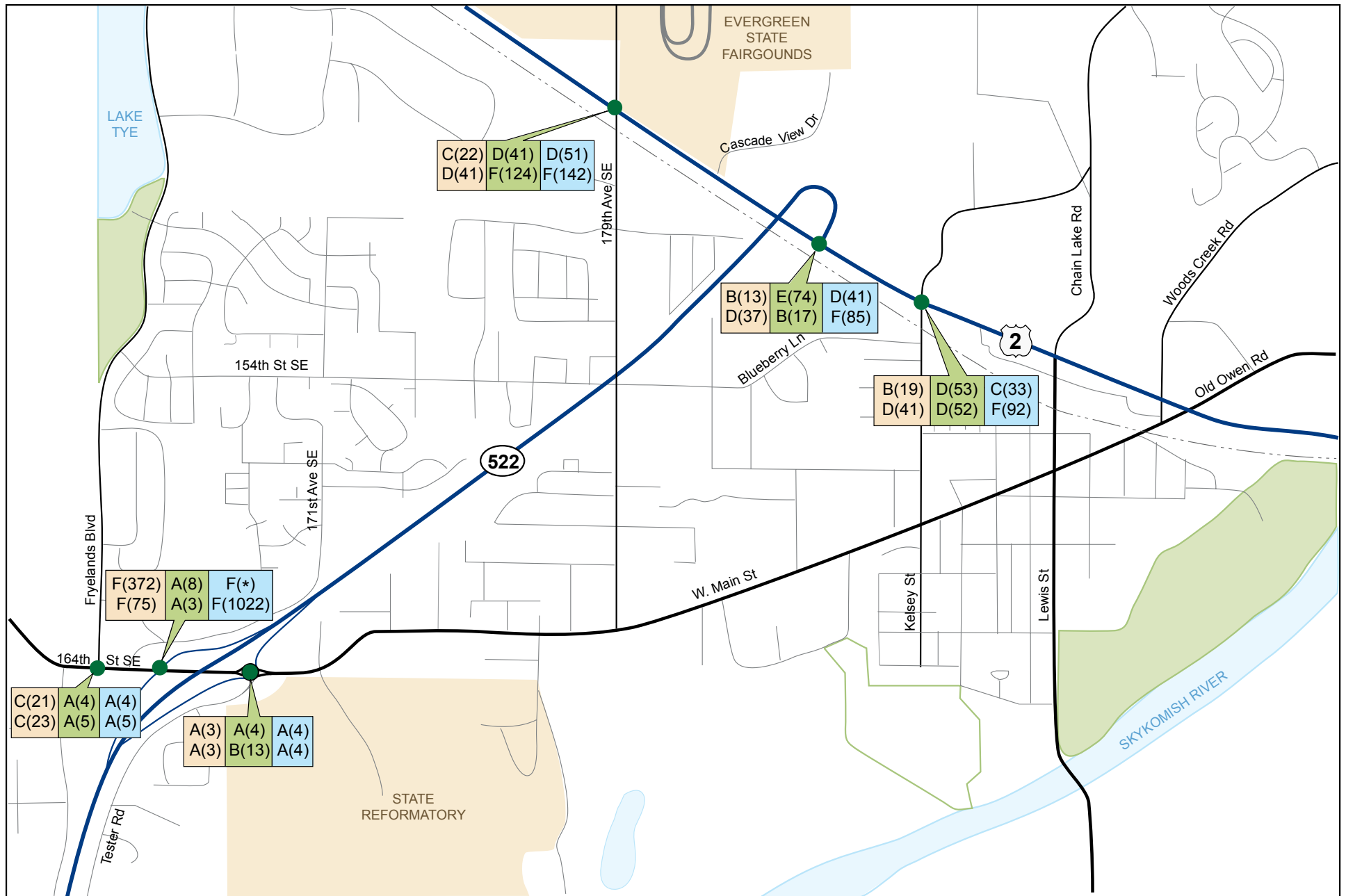
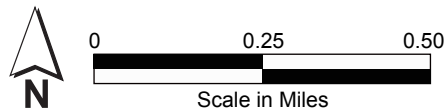


Exhibit 3-2
Year 2030 AM and PM
Peak Hour Highway LOS
With the Proposed Action



SR522 to US 2 Project 214-1631-038/03(041) 8/07 (B)



| Existing 2005 | Proposed Action 2030 | Without Project 2030 |
|------------------|----------------------------|----------------------------|
| A(3) | A(4) | A(4) |
| A(3) | B(13) | A(4) |

AM Peak Hour LOS (Average Delay in Seconds)
PM Peak Hour LOS (Average Delay in Seconds)
Note: (*) - Delay too high to be calculated

Exhibit 3-3
AM and PM Peak Hour LOS
and Delays at Intersections

What are the specific safety issues?

SR 522 currently has one lane in each direction without a median to separate traffic. Collisions on SR 522 between Fales/Echo Lake Road and US 2 increased 113 percent between 1994 and 2004. Additionally, the number of collisions that caused injuries increased by 40 percent during that time (WSDOT 2007a). Traffic volumes have increased substantially since 1994, and this upward trend is expected to continue as the area becomes more densely developed. Without a median meeting current design standards and separating the two directions of traffic, safety on SR 522 will continue to be a growing concern for people traveling on the highway.

3 How will the proposed action improve traffic and safety conditions?**How will SR 522 operate with the proposed action?**

With the proposed widening of SR 522 between Cathcart Road and US 2, SR 522 will have two lanes in each direction. In the year 2030, AM peak hour traffic volumes west of 164th Street SE will increase to approximately 1,000 vehicles per hour in the eastbound direction and 2,445 vehicles per hour in the westbound direction. During the PM peak hour, approximately 2,525 vehicles per hour are expected in the eastbound direction, and 1,240 vehicles per hour will travel westbound on SR 522.

Exhibit 3-2 presents the results of the highway LOS analysis for SR 522 with the proposed action. All locations of the highway studied will operate well at LOS C or better during both the AM and PM peak hours with the proposed action.

How will the intersections at 164th Street SE operate in the year 2030 with the proposed action?

Traffic congestion at the 164th Street SE interchange will generally be better with the proposed action as compared to the No Action Alternative, because the project will provide the roadway capacity needed to meet expected demand.

With the proposed action, a new roundabout will be constructed at the 164th Street SE/SR 522 westbound ramps

intersection to reduce traffic delays and queues associated with using stop signs or traffic signals at this intersection. The new roundabout, as shown in Exhibit 2-6, will be a modified two-lane roundabout with a bypass lane onto the westbound on-ramp. Because the majority of traffic in the area is generated by the residential developments along Frylands Boulevard to the west of the 164th Street SE interchange, only one lane will be required to serve eastbound traffic traveling through the interchange area. Eastbound traffic from 164th Street SE heading to westbound SR 522 will use a dedicated lane, completely bypassing the roundabout.

Exhibit 3-3 shows how the intersections on 164th Street SE will operate with the proposed action in the year 2030. The intersections on 164th Street SE will operate well (LOS B or better), with minimal delays and queues during both the AM and PM peak hours.

The traffic analysis also showed that the existing roundabout at the 164th Street SE/SR 522 eastbound ramps will operate at an acceptable level of service in the year 2030. However, traffic on the SR 522 eastbound off-ramp will back up onto the SR 522 mainline due to the high traffic volumes and the existing configuration of the off-ramp and roundabout.

To prevent traffic from backing up onto SR 522, the project will:

- Revise the configuration of the existing roundabout to allow the off-ramp traffic to stay in the outside roundabout lane to travel west on 164th Street SE.
- Extend the right turning pocket on the SR 522 eastbound off-ramp to approximately 500 feet.

The improvements will not substantially change the overall LOS of the roundabout itself, but they will improve traffic flow, shorten vehicle queues, and provide additional queuing storage at the SR 522 eastbound off-ramp.

How will the intersections at US 2 operate with the proposed action?

At the SR 522/US 2 interchange, WSDOT is proposing to construct a new ramp between eastbound SR 522 and eastbound US 2 for traffic destined east of N Kelsey Street. This new ramp will connect to an additional eastbound lane on US 2 extending up to Chain Lake Road, where it will drop off as a right-turn lane. An additional westbound lane on US 2 will also be constructed between SR 522 and Cascade View Drive. The proposed configuration for this interchange improvement is shown in Exhibit 2-7. With additional capacity being provided on SR 522 and increased traffic volumes in the corridor, the proposed new ramp will reduce the volume of traffic flowing through the signalized intersection of SR 522 with US 2.

Exhibit 3-3 shows the effects of the proposed SR 522/US 2 interchange improvement on year 2030 AM and PM peak hour LOS. With the proposed action, the N Kelsey Street/US 2 intersection will operate at LOS D during both the AM and PM peak hours in the year 2030. The SR 522/US 2 intersection will operate at LOS E during the AM peak hour and at LOS B during the PM peak hour. In the year 2030, the 179th Avenue SE/US 2 intersection will operate at LOS D during the AM peak hour and at LOS F during the PM peak hour. However, the proposed action will result in some reduction in average vehicle delays at this intersection as compared to the No Action Alternative. The 179th Avenue SE/US 2 intersection will operate at acceptable levels during both the AM and PM peak hours when the project is complete in the year 2013.

How will the proposed action affect safety along the corridor?

Widening SR 522 to two lanes in each direction will provide separation between the eastbound and westbound directions of traffic, improve safety, and potentially decrease the number of collisions. The additional lanes will increase the gaps between the vehicles, decreasing the probability of vehicle collisions. Median separation will reduce the potential for high-severity head-on collisions.

How will the project affect pedestrians and bicyclists?

No dedicated facilities or bicycle route signage are proposed along SR 522 as part of the project. Pedestrians and bicyclists will continue to be permitted, but not encouraged, to use the shoulders along SR 522. The preliminary design for the new roundabout at 164th Street SE includes a sidewalk on the north side of 164th Street SE, which will replace the existing paved shoulders through the intersection. A sidewalk and a 4-foot-wide bike-accessible shoulder will be constructed along the south side of US 2 between Kelsey Street and Chain Lake Road (SR 203).

In most places, the outside shoulder widths of the widened highway will be 10 feet, which exceeds the 4-foot minimum shoulder recommended for bicycle use in the WSDOT Design Manual, Section 1020. As a matter of policy, bicycle use of state highways is allowed unless specifically prohibited.

4 What will traffic and safety conditions be like in the future with the No Action Alternative?

How will SR 522 operate with the No Action Alternative?

Without the project, SR 522 will continue to operate as a two-lane limited access highway with one lane in each direction, and traffic volumes will be substantially higher than they are today. West of 164th Street SE, approximately 975 vehicles per hour are expected in the eastbound direction in the year 2030 and 1,835 vehicles per hour are expected to travel in the westbound direction during the morning commute (AM peak hour). During the evening commute (PM peak hour), approximately 1,775 vehicles per hour are expected to travel eastbound and 1,185 vehicles per hour would travel in the westbound direction. Exhibit 3-1 shows that SR 522 will operate poorly at either LOS E or LOS F during the AM and PM peak hours in the year 2030 without project improvements.

How will the intersections at the US 2 interchange operate in the year 2030 with the No Action Alternative?

For the year 2030 No Action traffic analysis, the project team assumed that the following changes will be made to the lane configurations at intersections on US 2:

- US 2 at N Kelsey Street – A second eastbound left turn pocket will be in place to serve traffic on eastbound US 2 heading to northbound N Kelsey Street. Westbound and eastbound U-turns will also be allowed on US 2 at N Kelsey Street.

- US 2 at SR 522 – U-turns will be allowed on US 2 for westbound US 2 traffic at the signal with SR 522.

Exhibit 3-3 shows the results of the year 2030 AM and PM peak hour intersection LOS analysis for the No Action Alternative.

During the AM peak hour, all three intersections evaluated along US 2 will operate at LOS D or better in the year 2030 if no project improvements are made. However, vehicle queues on US 2 will continue to be unacceptably long. During the PM peak hour, all three intersections along US 2 will operate poorly (at LOS F), and vehicle queues in all directions will spill over to the adjacent intersections.

How will the intersections at the 164th Street SE interchange operate in the year 2030 with the No Action Alternative?

For the year 2030 No Action Alternative, the project team assumed that a new two-lane roundabout will be in place at the Fryelands Boulevard/164th Street SE intersection. The intersections and ramps at the SR 522/164th Street SE interchange were assumed to be configured the same as they are today. These intersections were evaluated to determine how they will operate during the AM and PM peak hours in the year 2030 with no project improvements. The results of the intersection LOS analysis are shown in Exhibit 3-3.

Without the project, the two roundabouts at Fryelands Boulevard and the SR 522 eastbound ramps will operate well at LOS A during both the AM and PM peak hours in the year 2030. In contrast, the existing two-way stop-controlled intersection on 164th Street SE with the SR 522 westbound ramps will operate poorly at LOS F during the AM and PM peak hours in the year 2030. In particular, vehicles traveling southbound at this intersection will experience long queues if no improvements are made.

How will safety conditions be affected by growth in the corridor with the No Action Alternative?

Snohomish County is forecasted to grow by nearly 42 percent by 2020, compared to 2000 (PSRC 2004). By the year 2030,

the frequency and severity of collisions on SR 522 will likely increase due to high traffic volumes and more congested conditions. The number of collisions on US 2 will also likely increase by the year 2030 due to increased traffic volumes. However, the planned improvements on US 2 between SR 522 and N Kelsey Street may reduce collisions somewhat in that area.

How will pedestrians and bicyclists be affected with the No Action Alternative?

As with the proposed action, pedestrians and bicyclists will continue to be permitted, but not encouraged, to use the shoulders along SR 522. No changes will occur to existing sidewalks and shoulders along 164th Street SE and along US 2.

Effects on People

5 How will the project affect noise levels?

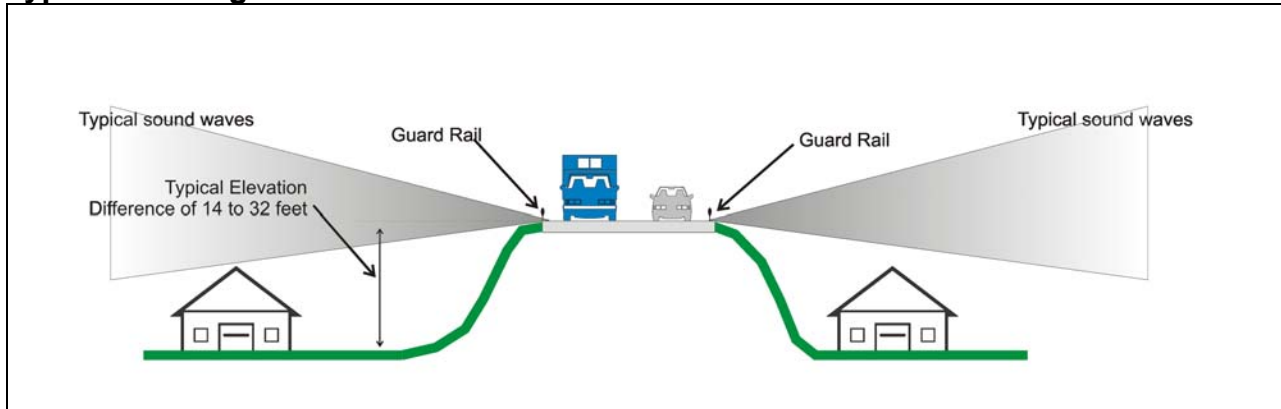
Existing Environment

Traffic on SR 522 and US 2 is the primary source of noise in the project area. Additional noise sources include commercial and industrial activities, noise from haul trucks using the rock quarry on 166th Street SE, ongoing small construction activities (e.g., residential development), and other general noise sources, such as general residential activities.

The area along SR 522 between 164th Avenue SE and the US 2 interchange is generally residential. SR 522 is on an embankment approximately 14 to 32 feet above the residences or buildings. Much of the noise from vehicles on SR 522 disperses above the neighborhoods, as shown in Exhibit 3-4 (Michael Minor & Associates 2007).

The Traffic Noise Impact Analysis (Michael Minor & Associates 2007) contains further details on the noise monitoring locations and the noise modeling locations for the proposed action.

Exhibit 3-4

Typical Existing Cross Section of SR 522 North of 164th Street SE

Closer to the Snohomish River Bridge, SR 522 runs between Bald Hill and the Snohomish River floodplain, where residential development is relatively sparse. The few residences in this area more frequently occur south and east of the highway and are at or below highway grade.

Existing noise levels were measured at 30 locations, which ranged from 56 to 68 dBA L_{eq} . A noise measurement of 50 dBA will sound like light traffic to a person standing 100 feet away, and a noise level of 70 dBA will sound like a vacuum cleaner to a person standing 10 feet away.

FHWA considers a traffic noise impact to occur when the L_{eq} approaches or exceeds 67 dBA L_{eq} for uses such as residences and schools. WSDOT considers a traffic noise impact to occur when predicted project-related noise levels are within 1 dBA of the FHWA criterion level, or when they substantially exceed existing levels. Therefore, residential impacts under the WSDOT noise impact criterion occur at 66 dBA L_{eq} .

Currently, it is estimated that three locations with five residences along SR 522 exceed WSDOT's traffic noise criterion of 66 dBA L_{eq} . This level is the minimum for which WSDOT will consider mitigation of noise impacts. All of the affected properties are located south of 164th Street SE. The only other affected area was a local path behind a few residences near Currie Road and 171st Street SE.

What is a dBA?

Sound levels are expressed on a logarithmic scale in units called decibels (dB). A-weighted decibels (dBA) are the commonly used frequency that measures sound at levels that people can hear.

To the human ear, a 1- to 3-dBA change is hard to distinguish, but a 5-dBA change in noise level is readily noticeable. A 10-dBA increase sounds like the noise level has doubled.

What is L_{eq} ?

L_{eq} is the average noise level over a specific period of time, such as hourly.

Project Effects

Future noise levels were modeled at 68 locations for the proposed action (Michael Minor & Associates 2007). With the proposed action, noise levels along the corridor are predicted to range from 59 to 72 dBA L_{eq} during peak hours.

Noise levels will be lower north of 164th Street SE because a large number of eastbound vehicles exit the highway at 164th Street SE, and new solid crash barriers (for example, Jersey barriers) will be installed through this portion of the highway (Exhibits 3-5 and 3-6). There are 15 locations south of 164th Street SE where predicted noise levels will be equal to or above the WSDOT impact criterion with the proposed action (Exhibit 3-7). These locations include 24 residences, a church, and a school. Of the 15 locations, 3 locations with 5 residences already exceed the WSDOT traffic noise criterion. All of the predicted traffic noise impacts are located south of 164th Street SE. The local path near Currie Road and 171st Street SE will also exceed the WSDOT traffic noise criterion.

Exhibit 3-5

Location of Crash Barriers

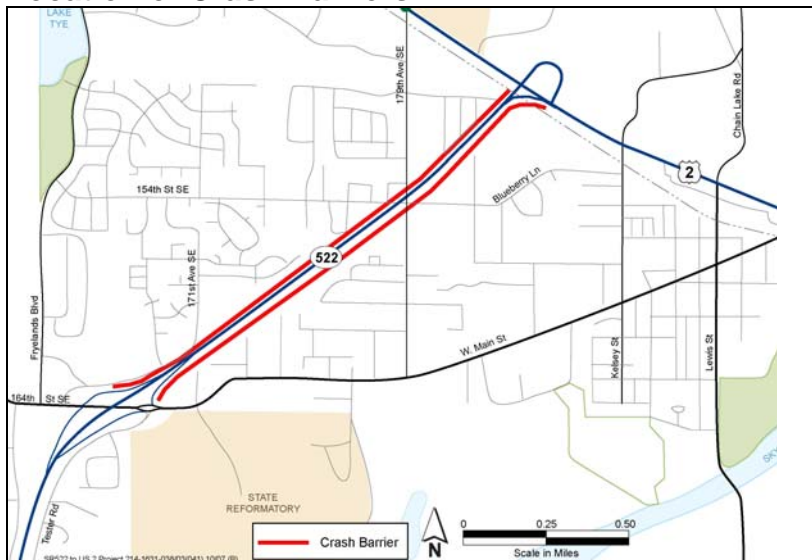


Exhibit 3-6

Typical Cross Section of the Proposed Action North of 164th Street SE

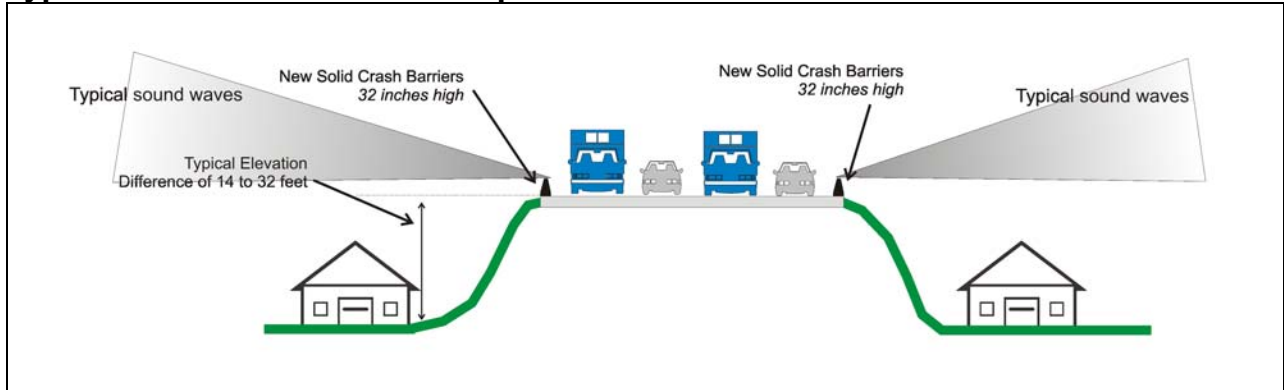
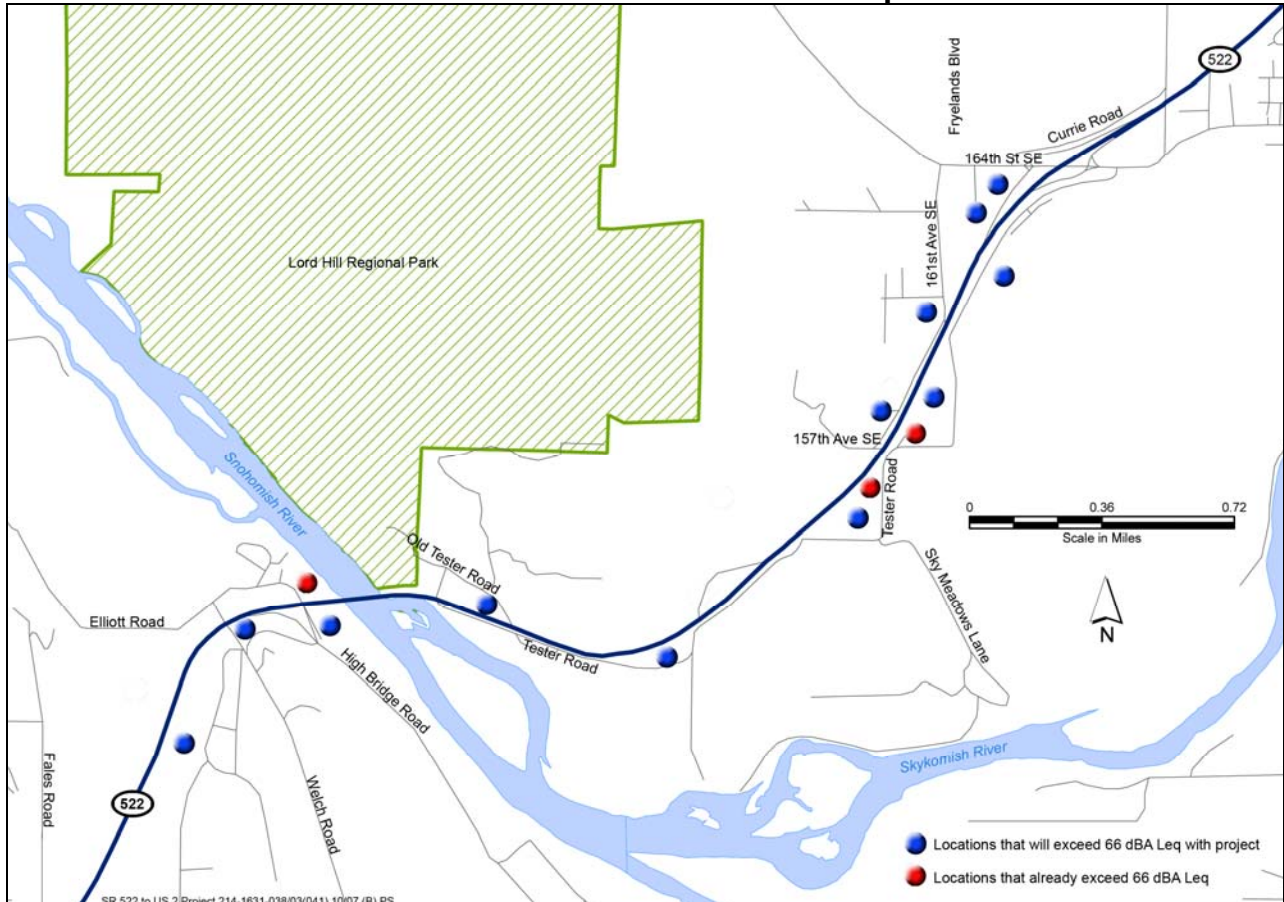


Exhibit 3-7

Locations that Exceed WSDOT Noise Criteria with the Proposed Action



6 Will the project affect air quality?

Existing Environment

The project area is in attainment for all pollutants of concern. This means that air pollutant concentrations are at or below acceptable levels established by the National Ambient Air Quality Standards (NAAQS) for carbon monoxide, particulate matter, ozone, sulfur dioxide, lead, and nitrogen dioxide. The proposed action is also outside of the Puget Sound carbon monoxide (CO) maintenance area (PSRC 2007, WSDOT 2007g).

The project is included in the Metropolitan Transportation Plan and Transportation Improvement Program.

Project Effects

Traffic volumes on SR 522 are expected to increase with or without the project. The improvements to the 164th Street SE and US 2 interchanges may create localized areas where daily traffic will increase and other areas where traffic will decrease. It is possible that localized increases and decreases in mobile source air toxics (MSAT) emissions may occur with these slight changes to the daily traffic. The magnitude and the duration of these potential increases cannot be accurately quantified because research is still being conducted on health effects and modeling techniques. If these increases do occur, they will be substantially reduced in the future due to implementation of the United States Environmental Protection Agency's (EPA) vehicle and fuel regulations.

The project will not result in exceedances of the NAAQS. Therefore, no design or operational changes will be required. In the future, if EPA develops standards for MSATs and tools to determine impacts of localized concentrations of air toxics, additional efforts will be identified to mitigate for air toxics impacts.

7 Will the project affect land use?

Existing Environment

The land between the vicinity of Cathcart Road and Monroe's city limits is sparsely developed. The land is mainly classified

Who regulates Air Quality?

Air Quality is regulated by the Environmental Protection Agency (EPA), the Washington State Department of Ecology, and the Puget Sound Clean Air Agency. National Ambient Air Quality Standards developed by EPA under the Clean Air Act established pollutant concentration levels that should not be exceeded.

What are Mobile Source Air Toxics?

To help protect air quality, the Environmental Protection Agency (EPA) identified a group of 21 pollutants as mobile source air toxics, which are set forth in an EPA final rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17235). From the list of 21, EPA has identified six priority mobile source air toxics. These are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. Currently, EPA has not established regulatory concentration targets for relevant mobile source air toxics appropriate for use in the project development process.

as agricultural 10 acre, rural 5 acre, or rural conservation property by Snohomish County, as shown in Exhibit 3-8. One area just west of Monroe's city limits is zoned as low density multiple residential. The Snohomish County Comprehensive Plan identifies the land from just south of milepost (MP) 22 to Monroe's city limits as a rural-urban transition area. Much of the undeveloped land outside the SR 522 right-of-way from Cathcart Road to Monroe's city limits is protected land, including public lands, wetlands, or floodplains. Land within the City of Monroe is much more densely developed, especially between 164th Street SE and US 2. Zoning along SR 522 within the City of Monroe is primarily urban residential. Commercial districts are located just off of SR 522 at both the 164th Street SE and US 2 interchanges.

Project Effects

SR 522 widening will take place within the existing right-of-way, except near the new Snohomish River Bridge, near Bald Hill, and where the new eastbound SR 522 ramp to eastbound US 2 will cross over the Burlington Northern Santa Fe (BNSF) right-of-way. Modifications to the interchanges with 164th Street SE and US 2 will not change the existing land uses in the area (WSDOT 2007c).

Due to topographic constraints, the presence of wetlands and streams, and the limited area of the right-of-way, some stormwater facilities will need to be constructed outside the existing WSDOT right-of-way. WSDOT considered the zoning, land use, and presence of critical areas for these sites when comparing alternative sites and best management practice (BMP) options. None of the potential stormwater facility locations will be on public or agricultural lands. However, several businesses and a pasture will be displaced, as discussed in Question 8.

Prepared by Parametrix, 12/12/07 K:\gis\1631-sr522\mapdocs\SR522-SnoCoZoning 121007.mxd



Parametrix

Legend

- | | | | |
|---------------|---------------------|----------------------------------|-----------------------------|
| ● Mileposts | Zoning | Mineral Conservation | Rural Industrial |
| — Highways | Agriculture-10 Acre | Neighborhood Business | Rural-5 Acre |
| — Local Roads | City | Low Density Multiple Residential | Suburban Agriculture-1 Acre |
| City | Forestry | Residential 9,600 sq.ft. | |
| Parks | General Commercial | Rural Conservation | |

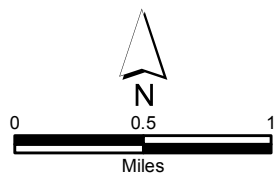


Exhibit 3-8

Snohomish County Zoning

8 Will the project displace any properties or businesses?

Existing Environment

The City of Monroe's primary commercial and business district is located along US 2 just east of SR 522. A commercial area is also located on both sides of SR 522 at the 164th Street SE interchange. South of 164th Street SE, agricultural businesses are scattered along the corridor.

Project Effects

Eleven properties will be partially or fully acquired by the proposed action. Two businesses, a car wash and a topsoil company, will be displaced by stormwater treatment facilities for the project, as shown in Exhibit 3-9. A portion of pasture will also be displaced by a stormwater treatment facility. The stormwater treatment facility will reduce the overall size of this property by a small percentage but will not displace the uses in other locations on the property.

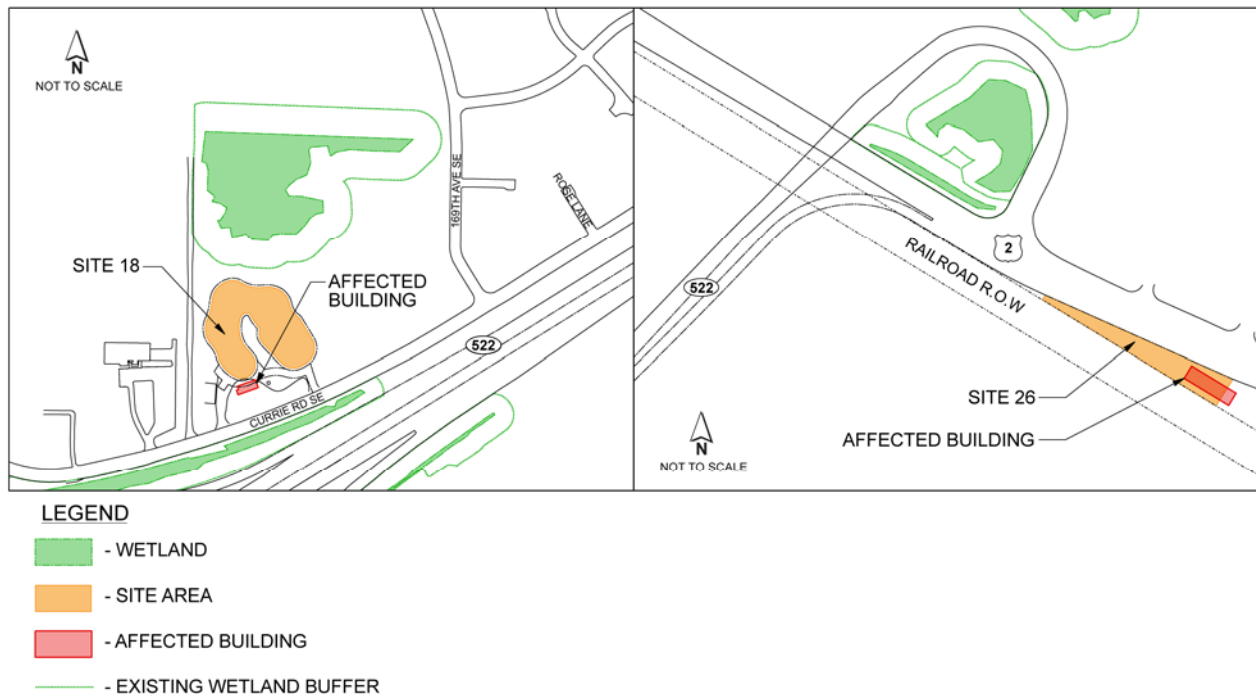
The existing 2,000-foot stretch of SR 522 right-of-way near Bald Hill is not wide enough to accommodate the slopes for the highway widening. The proposed action will cut into the steep slopes along Bald Hill, which will affect four properties.

Approximately 2.5 acres of land will be acquired. Three of the four properties have single-family homes on them; however, only one of the three residences will likely be displaced.

An agreement is needed with BNSF Railway to construct a bridge over the railroad tracks for the eastbound SR 522 to eastbound US 2 ramp. WSDOT is working with BNSF to receive a permanent easement for the bridge over the railroad tracks and a temporary easement for access within the railroad right-of-way to construct the bridge. The bridge will be constructed with a clear span over both existing railroad tracks and will provide space for a future third track.

Exhibit 3-9

Stormwater Treatment Facilities that Affect Businesses



9 Will the project affect views?

Existing Environment

Motorists passing over the Snohomish River have some brief views of the river and two of its major tributaries, the Skykomish and Snoqualmie Rivers, to the east. The existing views for motorists on SR 522 change depending on the time of year because many sections of the roadway are lined by deciduous trees. The landscape in the area includes a combination of plains and foothills leading up to the Cascade Mountains, which can be seen as motorists look beyond the roadway corridor. Residential buildings become increasingly common along the roadway towards Monroe. For motorists traveling near Monroe, views are dominated by development with more scenic views leading up to the Cascades as a backdrop. Some views to the west of Monroe are blocked by Bald Hill.

Project Effects

The additional roadway width and new Snohomish River Bridge crossing will increase the visual presence of SR 522,

WSDOT has assessed in detail the existing views and evaluated the effects of the project on these views. This detailed analysis is provided in the SR 522, Cathcart Road Vicinity to US 2 Project, Final Visual Quality Discipline Report (NWR 2007). A summary of the discipline report is contained in Appendix G.

particularly where mature vegetation is removed. Some adjacent properties may be exposed to light and glare that was previously blocked by vegetation, although these effects are expected to be minimal. The new ramp from eastbound SR 522 to eastbound US 2 will be visible from the railroad corridor and a few properties that are southeast of the new ramp, but this is not likely to really change the view. Distant views to the Cascade Mountains will remain similar.

Views from Lord Hill Regional Park, north of the Snohomish River Bridge, will include the new bridge. Views for people visiting or fishing in the park, and the property owners adjacent to the park, will be affected. Viewer sensitivity is fairly high because people spend time looking at the river. However, the changes to the visual quality of the view are expected to be minor because native vegetation along the river should screen some views of the bridge.

Views for the residential neighborhoods below the embankment in the Monroe City limits will be similar. The embankment will be wider, but it would look similar to existing conditions. The project will remove some mature vegetation adjacent to the embankment, which will decrease the quality of the view for residents if they look up the embankment to SR 522.

Additional light and glare from vehicles will be generated with the two new lanes. Since SR 522 is on an embankment through much of the densely populated areas, the additional light will be less noticeable. New lighting will be added near the 164th Street SE roundabouts and the US 2 interchange. These intersections already have lighting, so the effect of adding new sources of light and glare is expected to be minimal.

10 Will the project affect environmental justice populations?

Existing Environment

Census block groups in the project area were identified to determine the demographics. The census block groups compose the study area for the environmental justice analysis,

which is larger than the immediate vicinity of the highway. Based on data from the 2000 Census, minority populations make up approximately 14 percent of the population in the study area, which is less than the Snohomish County average of 16 percent. Approximately 8 percent of the households in the study area are low-income, which is slightly above the Snohomish County average of 7 percent (Parametrix 2007a).

The presence of minority and low-income populations was confirmed by obtaining school data for the study area from the 2004–2005 school years. The school data reflect higher levels of low-income populations and minority populations as compared to the census data (National Center for Education Statistics 2005).

Outreach Efforts

WSDOT has provided opportunities for minority and low-income populations to be involved in the decision-making process through its outreach efforts. These efforts have included providing project materials and notices in Spanish, having a Spanish interpreter at the public meeting, interviewing service providers, and interviewing businesses that may be displaced by the project.

Project Effects

The proposed action will not result in disproportionately high or adverse effects on minority or low-income populations because it will improve the safety and operations of the highway primarily within the existing right-of-way. Based on the results of interviews, the two businesses that will be displaced by the project do not employ minority or low-income staff or serve predominantly low-income or minority populations. Likewise, the property acquisitions for the rock cuts along SR 522 will not impact minority or low-income populations or service providers for these populations.

Minority and low-income populations will experience some benefits from the project equally with the rest of the population, primarily due to access and circulation improvements.

11 Will the project affect public services and utilities?

Existing Environment

Public service providers that may be affected by the project include law enforcement, fire and emergency medical response, public transit, school transportation, mail and newspaper delivery services, and garbage/recycling vehicles. These resources cross and travel on the highway. Many other public services, such as hospitals, are located nearby in the City of Monroe, but are not adjacent to SR 522 (WSDOT 2007e).

One Community Transit bus route, Route 424, operates on SR 522. This route runs only on the weekdays between the Snohomish Park-and-Ride lot and downtown Seattle.

Utilities known to abut or cross the SR 522 corridor include buried and aerial power cables, cable TV lines, sanitary sewer and water main lines, natural gas lines, and telephone lines.

Project Effects

Most of the SR 522 improvements will occur on state-owned right-of-way and therefore will have little direct effects to service providers once the project is built.

Providing two lanes in each direction with a center median will make the roadway safer for transit and emergency service providers. Community Transit may experience more reliable service in the project area. Emergency service providers using SR 522 may be able to respond to a call more efficiently with the additional lane.

12 How will the project affect people in the community and neighboring residences?

Existing Environment

Several community resources are located near the project area, including:

- Lord Hill Regional Park, Currie View Park, and Blueberry Children's Park
- Bike paths

- First Baptist Church, Heritage Baptist Church, and Church of Jesus Christ of Latter Day Saints
- Monroe High School

These resources are near but do not have direct access to the highway.

Between Cathcart Road and 164th Street SE, the residences near the project area are on large lots. The neighborhoods become much more densely populated within the city limits of Monroe, north of 164th Street SE to US 2.

Project Effects

The additional lanes, grade separation, and interchange improvements will benefit the community and local residents greatly by creating a much safer facility with increased vehicle capacity. Most of the improvements will occur on state-owned right-of-way and would therefore have little direct effect on community resources and neighbors. Once the highway is constructed, none of the parks or churches will be affected.

Stormwater treatment facilities will change the neighborhood slightly, as two businesses and a portion of pasture will be displaced. The stormwater facilities will be adjacent to other businesses, some residences, and a church.

13 Will the No Action Alternative affect people along the corridor?

Under the No Action Alternative, noise levels along the corridor are predicted to range from 56 to 68 dBA L_{eq} during the peak evening traffic hours. An estimated 21 residential land uses along the project area in the year 2030 will exceed the WSDOT traffic noise criterion of 66 dBA L_{eq} . All but four of the properties with predicted traffic noise impacts are located south of 164th Street SE. The local path located near Currie Road and 171st Street SE will also exceed the WSDOT traffic noise criterion.

Under the No Action Alternative, traffic will worsen as described in Question 4. This will affect people living in and traveling through the area.

Effects on Ecosystems

14 How will stormwater be managed?

Existing Environment

The project is located within Snohomish Water Resource Inventory Area (WRIA) 7. The watershed covers approximately 1,780 square miles and is the second largest Puget Sound drainage. The drainage area at the project location is approximately 1,537 square miles (USGS 2006). The project area is a very small portion of this watershed.

SR 522 crosses the Snohomish River at river mile 20.55, just downstream of the confluence of the Snoqualmie and Skykomish Rivers. Approximately half way along the project roadway, between threshold discharge areas (TDAs) 3 and 4, SR 522 leaves the Snohomish River Basin and enters French Creek Basin. Stormwater from the project area flows to a series of unnamed streams and ultimately to the Snohomish River. Stormwater from the 31.8 acres of existing impervious surface within the project area currently receives little or no stormwater treatment or detention (Parametrix 2007b).

What is a Threshold Discharge Area (TDA)?

TDAs are areas where stormwater is generated and drains to a single or multiple natural discharge locations within one-quarter mile downstream. Exhibit 2-7 shows the TDAs in the project corridor.

Project Effects

The project will result in 21.4 acres of new impervious surface within the project area. Stormwater from the new and the remaining existing impervious surface area will be managed within six TDAs, as shown in Exhibit 2-8. Stormwater will receive treatment prior to being discharged, which is an improvement over existing conditions. Stormwater from all TDAs except TDA 1, and potentially TDA 2, will be detained prior to discharge. Site-specific effects and concerns associated with each TDA are described below. Exhibit 2-8 shows the stormwater facilities proposed within the six TDAs.

TDA 1

Alternative locations for the stormwater facility for TDA 1 are very constrained by Tester Road, the river, and Lord Hill Regional Park. Consequently, the stormwater facility (Site 3A) for this TDA will be located outside of the SR 522 right-of-way and within a portion of a wetland buffer and the 100-year

floodplain, as shown in Exhibit 2-8. The effects of the facility on the wetland and floodplain are further discussed in Question 16, How would the project affect wetlands, floodplains, wildlife, and vegetation? Because TDA 1 will directly discharge to a new outfall on a side channel of the Snohomish River, the WSDOT Highway Runoff Manual does not require that stormwater be detained. Stormwater facilities that provide treatment but not detention are smaller than those that provide detention. Thus WSDOT has minimized project effects on the wetland, wetland buffers, and the floodplain.

TDA 2

Alternative locations for the stormwater facility are very constrained by the steep rock hillside on the north side of SR 522 and by Tester Road, large wetland complexes, an oxbow channel, and the 100-year floodplain on the south side of SR 522. Accordingly, the stormwater facility (Site 4A) for TDA 2 will be located outside of the SR 522 right-of-way on a smaller wetland. The effects on the wetland are described under Question 16. These effects will be reduced if stormwater is not detained, because the facility size will be smaller.

Reducing the size of the facility will affect only a portion of the wetland, leaving approximately 1.1 acres of wetland area instead of filling the entire 2.9 acres. However, stormwater from this facility will not directly discharge to the Snohomish River but be discharged via an outfall to the edge of a wetland and then conveyed through four unnamed streams that converge into an oxbow side channel of the Snohomish River. Although the results of a preliminary downstream analysis

show the effects to be minimal (ABKJ 2007), WSDOT is conservatively assuming that permitting agencies will require detention.

TDA 3

Due to the topography and the proximity to roads, development, wetlands, and streams, the only two options for siting a stormwater facility (Site 7) for TDA 3 are outside the SR 522 right-of-way. One option will displace three residential properties; the other will displace a portion of a pasture located

What is the Highway Runoff Manual?

WSDOT's Highway Runoff Manual (HRM) is the guidance used to design stormwater systems for transportation projects. The HRM, along with WSDOT's Hydraulics Manual, provides tools for designing effective stormwater collection, conveyance, and treatment systems for highways and other transportation-related facilities.

on a wetland. WSDOT is proposing to displace the pasture and fill the wetland. The effects on the wetland are described in Question 16. Stormwater from TDA 3 will be detained and treated, then discharged via an outfall at the edge of an unnamed stream to an oxbow side channel.

TDA 4

Due to the topography and the proximity to roads, development, wetlands, and streams, the stormwater facility (Site 11) for TDA 4 will be located outside the SR 522 right-of-way and on an existing low-quality wetland. The effects on the wetland are described under Question 16. Stormwater from TDA 4 will be detained and treated, then discharged via an outfall to a series of unnamed streams in the French Creek system.

TDA 5

TDA 5 is the largest TDA in the project area, spanning the area from 164th Street SE almost to US 2. In the eastern portion of the TDA, it appears that infiltration will be feasible; thus, infiltration trenches are proposed along the edge of the right-of-way. In the western portion of TDA 5, where infiltration is not feasible, alternative locations for a stormwater facility are very constrained by existing development. Therefore, a large stormwater facility (Site 18) that provides treatment and detention will be located outside the SR 522 right-of-way and will displace a topsoil company. Smaller facilities (Sites 12 and 15) within the 164th Street SE interchange will affect wetlands and streams. Water from these stormwater facilities will be discharged via an outfall to a ditch before entering a series of unnamed streams in the French Creek system.

TDA 6

Alternative locations for a stormwater facility in TDA 6 are limited by the surrounding development, flat topography, highway road fill, and the proximity to wetlands and streams. The proposed facility north of SR 522 (Site 24) will affect a stream and stream buffer, as described in Question 16. The facility south of SR 522 (Site 26) will be constructed outside the right-of-way, displacing a car wash. In TDA 6, an oil

control facility will be required to treat stormwater generated at the intersection of SR 522 and US 2, because of the average daily traffic volumes (15,000 vehicles). Stormwater from TDA 6 will be treated and detained, then discharged to the existing storm drain system before entering French Creek via a series of unnamed streams.

Summary of TDAs

In summary, approximately 3.8 acres of the wetland area and 2.8 acres of the wetland buffer area will be filled by the stormwater facilities. These impacts are located adjacent to rural and urban residences and rural and urban open spaces.

All treatment facilities will involve construction of new outfall locations. For TDAs 2 through 6, the construction will be done during the dry season when these streams have very low flow or are dry. For TDA 1, the planned discharge pipe is at existing riprap and above the ordinary high water mark, which will have no effects on off-channel or riparian habitat. The discharge pipe and outfall for TDA 1 will not affect the floodplain because stormwater will be transferred to the discharge site in an underground pipe.

Water Quality

The primary pollutants of concern in roadway-generated stormwater runoff are total suspended solids (TSS), dissolved and total zinc, and dissolved and total copper. An increase in impervious surface can result in a change in the loading of these pollutants (the amount of a pollutant, by weight, that enters a receiving water body on a per-year basis). An increase in impervious surface can also change the concentrations of pollutants discharged in stormwater (the amount of a pollutant present in a given amount of water). Pollutant loading can be thought of as the total amount of a pollutant, while concentration is the strength of the solution containing the pollutant.

Although widening the highway will add impervious surface to six TDAs and some individual TDAs will have a slight increase in pollutant loading for some substances (i.e., dissolved and total copper and zinc), the pollutant loading

within the overall project area for TSS, total and dissolved zinc, and total copper will decrease because stormwater from both the new and existing impervious surface will be treated. The loading of dissolved copper will increase slightly due to the increase in impervious surface and because the copper removal efficiency for stormwater treatment BMPs is not 100 percent. However, concentrations of all of the pollutants, including copper, will decrease within the overall project area, in some cases substantially (e.g., TSS). Concentrations of the pollutants of concern will decrease in all cases. Compared to existing baseline conditions, water quality will be maintained or slightly improved, and no adverse effects to aquatic species will occur due to project stormwater.

Groundwater

Although the proposed action will increase impervious surface area by 21.4 acres, it will have minimal or no effect on groundwater quantity, quality, or recharge. This is because the roadway is only a fraction of the size of the total groundwater system. Groundwater quality will be unaffected because stormwater from each TDA will be treated and discharged directly to the identified unnamed streams and ultimately to the Snohomish River. Stormwater treatment will benefit fish, wildlife, and vegetation compared to the existing conditions.

15 How will the project affect fish and streams?

Existing Environment

The project area includes a reach of the Snohomish River mainstem and a right-bank side channel of the river, which are both located less than a mile downstream of the confluence of the Skykomish and Snoqualmie Rivers.

The Snohomish River is known to support numerous fish species, including Chinook, coho, chum, and pink salmon, as well as steelhead, cutthroat trout, and bull trout. Many species of West Coast salmon and a number of other salmonid species spend at least a portion of their lifecycle in the reach of the Snohomish River located along this portion of SR 522. Chinook salmon, steelhead, and bull trout are currently listed as threatened under the Endangered Species Act. This reach of

What is a salmonid?

A salmonid is any fish that belongs to the Salmonidae family, including salmon, trout, char, and whitefish.

Fisheries Discipline Report

The Fisheries Discipline Report (Parametrix 2007c) contains exhibits showing the locations of all streams within the project corridor.

the Snohomish River has been designated by resource agencies as critical habitat for Chinook salmon and bull trout. In addition, the Puget Sound/Strait of Georgia populations of both coho salmon and river lamprey are listed as federal species of concern.

In addition to the Snohomish River, 13 streams (all tributaries to the Snohomish River) were identified within the project area. Five of the surveyed streams have known or presumed fish presence, predominantly coho salmon and cutthroat trout. Of these five streams, two cross under SR 522 via culverts and the culverts have been identified by WDFW as being known fish passage barriers. WSDOT will meet the State criteria for replacement. WSDOT will replace these two culverts with fully fish-passable culverts (one of which would also be a wildlife crossing). The other nine streams do not appear to support fish, due to natural barriers, seasonal flow regimes, or degraded habitat quality.

Fish habitat conditions within and adjacent to the 13 streams vary substantially, from severely degraded to properly functioning. The natural drainage patterns of many of the streams have been altered by road construction and other development. Other streams have mostly maintained the natural habitat and drainage patterns, are in fair to good condition, and adequately support aquatic life.

Project Effects

Effects to fish will generally be temporary and due to construction-related activities, which are discussed in Chapter 4. However, some permanent impacts will also occur.

The new bridge pier located mid-channel in the Snohomish River will result in a permanent loss of 80 square feet of migration habitat in the Snohomish River. However, because of the relatively small size of the bridge pier (10-foot diameter), the large width of the river at this location (over 500 feet), and the uniform cross section at the bridge location, no substantial alterations to fish migration are expected to result from the new bridge pier. The bridge pier will result in a slight loss of migration habitat, and the new bridge deck may increase

What are the culvert design requirements?

The design of the two fish-passable culverts will be in compliance with Washington Department of Fish and Wildlife fish-passage criteria (WAC 220-110-070) and will be based on the Design of Road Culverts for Fish Passage (WDFW 2003) manual. In addition to providing for fish passage, the design will take into account other factors such as direct habitat loss, water quality, upstream and downstream channel impacts, ecological connectivity, channel maintenance, construction impacts, and risk of culvert failure.

shading within the Snohomish River. However, due to the height of the new bridge, shading impacts will be minimal, and not of a magnitude to alter fish behavior or influence predation (Parametrix 2007c).

Culvert extensions and highway widening will affect approximately 1,030 linear feet of stream channel, but only 205 feet will occur in salmonid-bearing streams. Exhibit 3-10 shows two examples of how the highway widening will affect streams.

Approximately 2.6 acres of riparian buffers will be permanently affected. These effects will primarily occur under the additional bridge over the Snohomish River, in several places on the north side of SR 522 where highway widening will cut into the steep slopes of Bald Hill, and along 164th Street SE and US 2 where these roads will be widened.

Overall, the fish environment in the long term will be improved by the removal of fish barriers with the two culvert replacements and the addition of stormwater treatment in this portion of SR 522. The two culvert replacement locations are shown on Exhibit 2-10.

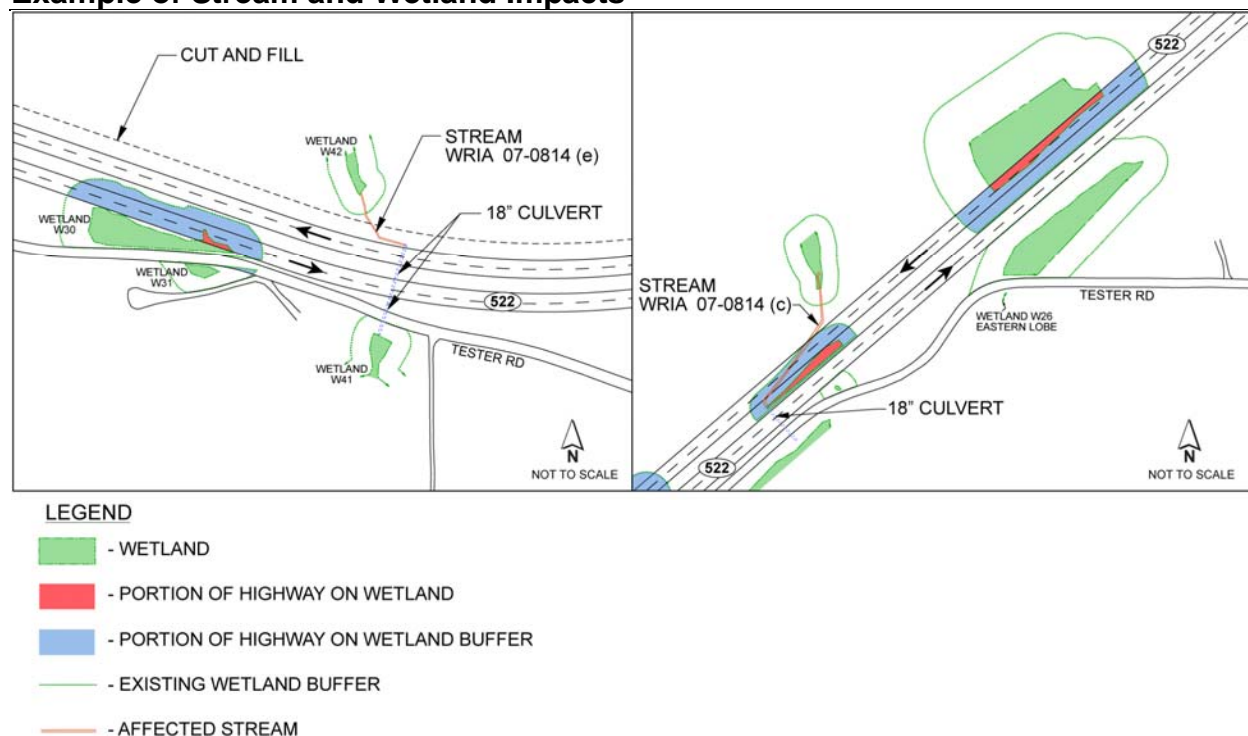
What type of review is required for endangered species impacts?

Section 7 of the Endangered Species Act (ESA) requires Federal agencies to ensure that their actions do not jeopardize the continued existence of an endangered or threatened species, or their critical habitats.

Because listed endangered or threatened species are known to occur in the project vicinity, WSDOT prepared a Biological Assessment (BA) describing how the project would affect the species. The evaluation determined listed species are likely to be harmed by the project. Thus, FHWA initiated formal consultation with U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) to determine the ways the proposed action will be implemented to conserve listed species and their habitat.

Exhibit 3-10

Example of Stream and Wetland Impacts



16 How will the project affect wetlands, floodplains, wildlife, and vegetation?

Existing Environment

Wetlands

Forty-eight wetlands were identified in the project area, 15 within the City of Monroe and 33 in unincorporated Snohomish County (Parametrix 2005, 2007d, 2007g).

Floodplains

The floodplains near the SR 522 project surround the Snohomish River and the area just south of Bald Hill, which includes a combination of rural residential and agricultural land uses and open space. The 100-year floodplains in the region are extensive and surround the Skykomish, Snoqualmie, and Snohomish Rivers, as shown on Exhibit 2-8.

Peak floods in the Snohomish River generally occur in late fall (November) or early spring (February) and are associated with

How were wetlands delineated?

Biologists delineated wetlands using the methodology outlined in the Washington State Wetlands Identification and Delineation Manual (Ecology 1997) and the U.S. Army Corps of Engineers (Corps) Wetland Delineation Manual (Environmental Laboratory 1987). Figures depicting the delineated wetlands are shown in the Wetlands Discipline Report (Parametrix 2007g).

heavy rainfall and rain-on-snow events (Parametrix 2007e). Much of TDA 1 becomes inundated during flood events.

Snohomish County has regulatory authority for issuing flood hazard permits for the construction of any fill or structure within the 100-year floodplain and floodway associated with the Snohomish or Skykomish Rivers. The Snohomish County Code requires demonstration that such a project will not raise the base flood elevations and compensatory mitigation for fill in the 100-year floodplain.

The project is not located within the City of Monroe's flood hazard area.

Wildlife

Numerous species of birds, mammals, amphibians, and reptiles are likely to occur in the project area. Biologists observed many species during field investigations, especially in the less developed area between the floodplain/agricultural lands and Bald Hill. Special-status species documented or expected to occur in the area include the following:

- Western toad (may occur, state candidate)
- Bald eagle (documented, state threatened species)
- Peregrine falcon (may occur, state sensitive species)
- Pileated woodpecker (documented, state candidate)
- Townsend's big-eared bat (may occur, state candidate)

A bald eagle nest occurs approximately 0.5 mile from SR 522, and less than 1 mile from where blasting will take place under the proposed action. A historic bald eagle communal winter roost site occurs approximately 1 mile south of the Snohomish River Bridge. In addition to special-status species, many migratory birds and game species occur in the project area. For example, the existing bridge across the Snohomish River supports nests of cliff swallows, a species of migratory bird.

Vegetation

Vegetation in the SR 522 right-of-way and on the proposed sites for stormwater facilities consists of four general land

FEMA Maps

The Federal Emergency Management Agency (FEMA) has mapped both the 100-year and 500-year floodplain for the Snohomish and Skykomish Rivers. The base flood elevation increases from 39 feet National Geodetic Vertical Datum (NGVD) 29 near the bridge to 44 feet NGVD 29 near the SR 522 and US 2 interchange.

cover types: grass/shrub, forest, wetlands, and open water, as well as developed land. The most common plants in the project area are grass and shrub species, including salmonberry, Himalayan blackberry, and red-osier dogwood, as well as croplands, residential landscaping, and maintained vegetation in the highway right-of-way. Near MP 21, SR 522 cuts into the southern slope of Bald Hill, an extensively forested area supporting mixed stands of Douglas-fir, bigleaf maple, and red alder. Most of the project area has been subject to a variety of human disturbances over the past 150 to 200 years, including timber harvest, conversion to agriculture, road construction, and urban development. This has resulted in major alteration of the original vegetation. Fifty-one species of ethnobotanical resources were identified as potentially occurring in the corridor, 28 of which were documented during field visits (Parametrix 2007f). There are no known occurrences of special-status plants in the project area, and no old-growth forest occurs in the study area.

Project Effects

Wetlands

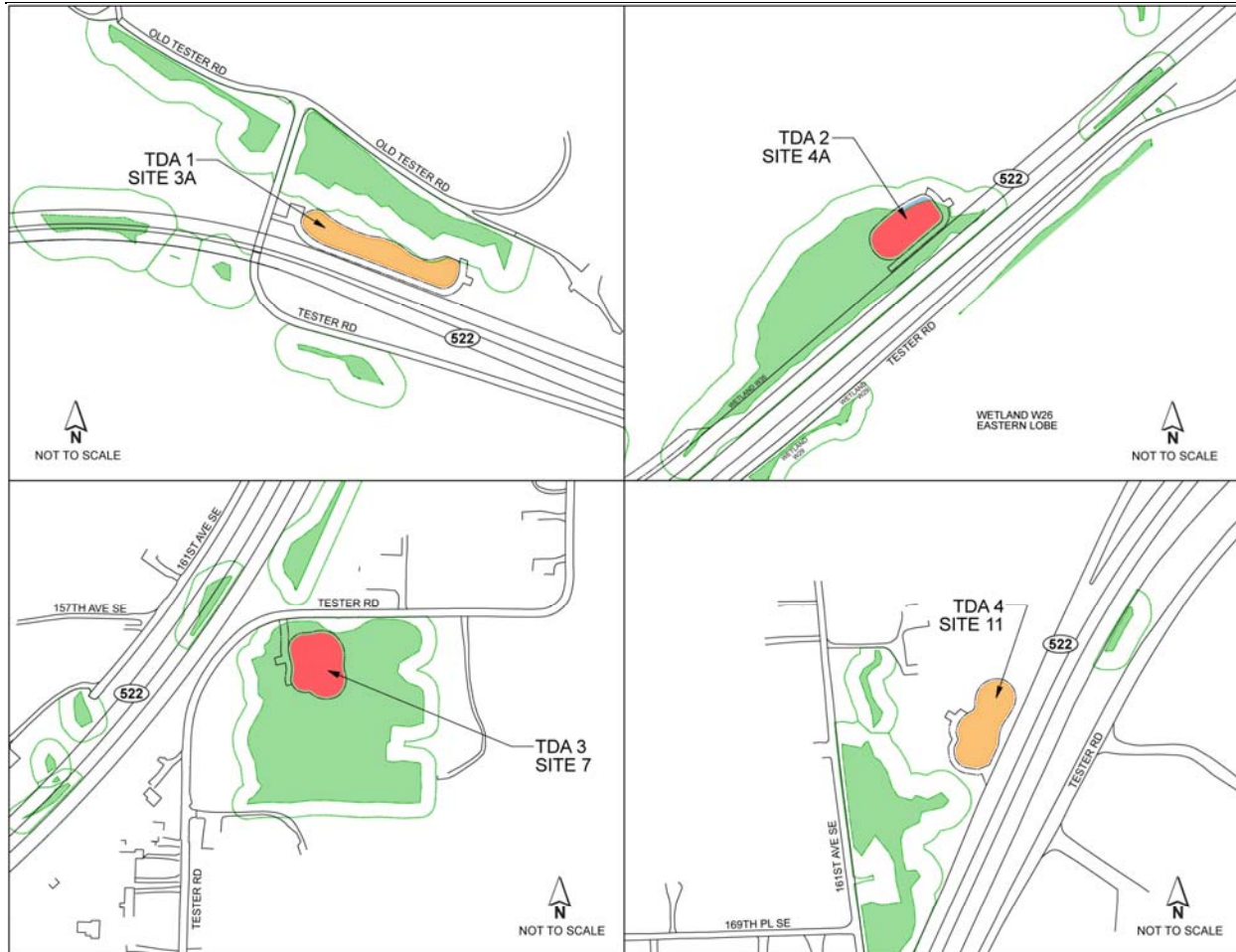
The proposed action will include filling wetlands and clearing or reducing the size of wetland buffers. Exhibit 3-10 shows two examples of how the highway widening will affect wetlands. Approximately 5.7 acres of wetland and 9.9 acres of buffer will be eliminated as a result of this project. Of the total area, about 3.8 acres of the wetland and 2.8 acres of the buffer impact areas are associated with stormwater facilities (Exhibit 3-11). The remaining 1.9 acres of wetland and 7.1 acres of buffer areas to be filled or cleared are adjacent to the existing road. These areas are currently somewhat disturbed because of past or ongoing road maintenance and adjacent residential development.

What are ethnobotanical resources?

Ethnobotanical resources are plants and lichens that have traditionally been used by various cultures in western Washington. Traditional uses include food, medicine, fibers, textiles, and building materials.

Exhibit 3-11

Stormwater Treatment Facilities that Affect Wetlands and Wetland Buffers



LEGEND

- WETLAND
- PORTION OF SITE ON WETLAND
- PORTION OF SITE ON WETLAND BUFFER
- SITE AREA
- EXISTING WETLAND BUFFER

Without mitigation, the physical changes to the wetlands and their buffers will also affect the ecological functions and values these areas provide. Filling wetlands will reduce the overall stormwater storage capacity in this portion of the basin. This in turn will affect groundwater and stream flows. Proper stormwater management will mitigate for this lost function. Loss of buffers will also affect water quality functions by reducing biofiltration potential and making wetlands potentially more susceptible to erosion and sedimentation. Reducing wetland and wetland buffers through clearing and grading will decrease wildlife habitat and the overall value of the area for wildlife (since buffer vegetation provides visual screening and dampens noise).

Floodplains

The new bridge pier in the center of the Snohomish River and the other proposed piers in the floodway and floodway fringe will not have major impacts to debris/sediment transport or flood conveyance (WEST 2007). The piers will not likely affect river morphology. Preliminary hydraulic modeling indicates that the piers will result in an approximately 0.05-foot increase in the 100-year base flood elevation upstream of the bridge. Because this is a relatively small rise compared to the total flood depth, this increase is not likely to affect scour or flooding severity.

The proposed action will also place approximately 10,000 cubic yards of fill in the 100-year floodway fringe to construct portions of the road alignment in the vicinity of the bridge, and an additional 17,000 cubic yards to construct the stormwater treatment facility in TDA 1. Because the amount of fill is very small compared to the total flood storage volume, the proposed fill required for the road embankment and stormwater ponds should not have major adverse effects to conveyance or flood stages in the Snohomish River.

Wildlife

The primary effects to wildlife related to the project will be the loss of habitat. Most of the habitat that will be lost is the grass/shrub type, which is abundant in the area. Project-related

impacts under the proposed action will not be expected to result in adverse effects to any wildlife species. The proposed action will be unlikely to have any adverse effects on any special-status species. See Questions 18 and 22 in Chapter 4 (Construction Effects and Mitigation) for a discussion of the measures that WSDOT will implement to avoid disturbing bald eagles.

Expansion of the roadway corridor in forested areas will reduce the amount of forested habitat available. Species that may be affected include opossums, raccoons, woodpeckers, and cavity-nesting birds such as chickadees. Converting wetland habitat to a developed condition will reduce the amount of habitat for amphibians and other species that depend on wetlands for breeding, feeding, resting, and other needs. Mitigation or avoidance measures recommended for the forested and wetland areas are discussed in Question 22, What measures are proposed to mitigate the project's permanent effects?

Increased traffic volumes are also expected to increase vehicle-animal collisions. To reduce this risk, a wildlife undercrossing will be constructed near MP 22. The undercrossing will be designed to accommodate a variety of species ranging in size from amphibians and small mammals to deer and large carnivores.

Vegetation

The proposed action will cause vegetation within the project footprint to be lost. However, most vegetation in the project footprint consists of grass and shrub species that are not native to the area and thus are not likely to be associated with traditional uses in western Washington. The potential for effects on shrub and tree species with ethnobotanical value will be minimized by avoiding impacts to forested habitats where possible.

Once the project is constructed, vegetation will be replaced where practical. The revegetation plan will include the use of native tree and shrub species, including ethnobotanical species as appropriate.

How does the Endangered Species Act consultation process fit in with the development of mitigation?

In January 2008 and February 2008, respectively, USFWS and NMFS issued biological opinions which analyzed the extent to which listed species would be harmed and specified conservation measures to reduce the effects.

17 Will the No Action Alternative cause effects to ecosystems along the corridor?

Without the project, stormwater in the project area will continue to receive little or no stormwater treatment or detention. Increasing traffic volumes will increase the pollutant levels in the water running off from SR 522. Pollutant levels in the TDAs are expected to rise if no action is taken. This will degrade the water quality and harm streams, wetlands, vegetation, fish, and wildlife.

In addition, fish passage will continue to be blocked at two culvert locations under SR 522, and wildlife will not have an undercrossing for moving across the corridor.

Other Effects

18 Will the project affect cultural resources?

Existing Environment

WSDOT has been coordinating and will continue to consult with tribes who have traditional homelands in the project area. Information on the project has been provided to the Snoqualmie Tribe, the Tulalip Tribes, the Snohomish Tribe of Indians, the Yakama Nation, and the Duwamish Tribe. These tribes have important information on natural, cultural, and archaeological resources in the study area, which WSDOT can incorporate into the environmental and design processes.

Some of the local tribes are interested in archaeological resources in their tribal consultation areas. Portions of the project area are in the Snohomish and Skykomish River floodplains or level areas above and directly adjacent to the floodplains that have a moderate to high probability for archaeological resources.

Project Effects

The project should not adversely affect cultural or archaeological resources because the cultural resources inventory did not identify any structures, properties, or resources on or eligible for the National Register of Historic Places or other local historical registers within the area of

National Historic Preservation Act, Section 106

This federal law requires effects of a project on cultural resources to be considered during the planning process.

WSDOT has consulted with the State and tribes, as documented in Appendix E, which contains the Section 106 correspondence.

potential effects. In addition, a qualified archaeologist will assess stormwater treatment facilities, staging areas, and wetland or stream mitigation areas prior to any construction that will disturb the ground. A professional archaeologist will monitor ground-disturbing activities in areas with a moderate to high probability for resources so that any undiscovered resources are protected.

19 Will the project affect historic properties?

While two buildings in the project vicinity may be eligible for the National Register of Historic Places (i.e., the Anderson Farmstead/Farmhouse and the barn at Lord Hill Regional Park), these buildings are not close enough to the SR 522 project to be adversely affected.

20 Will the project affect public lands?

No permanent improvements are proposed on public lands, causing no adverse effect to Section 4(f) properties or other public lands (Appendix I).

21 Will the No Action Alternative cause any other effects?

The No Action Alternative will not affect historic or cultural resources or public lands.

Mitigation for Permanent Effects of the Project

22 What measures are proposed to mitigate the project's permanent effects?

Transportation

No transportation improvements are recommended beyond those identified as part of the proposed action.

Noise

Noise mitigation was examined for all areas that meet or exceed the WSDOT threshold criteria of being reasonable and feasible, and none were found to be cost-effective. This is primarily due to low-density development in the area and large

lot sizes where impacts were identified. In addition, topographical conditions in the area make noise mitigation difficult because many of the residences that meet or exceed the criteria are located uphill from SR 522. This makes any use of noise barriers less effective. However, solid crash barriers (for example, Jersey barriers) to be placed on both sides of the highway between 164th and US 2 will disperse noise above the adjacent residential areas (Michael Minor & Associates 2007).

Displacements

Relocation assistance will be provided for one residence, two businesses, a carwash and topsoil company, in accordance with the Uniform Relocation Assistance and Real Property Policies Act of 1970, as amended (42 United States Code [USC] 4601 et seq.) and implemented by FHWA under 49 CFR Part 24. It will also be in accordance with the Revised Code of Washington (RCW) 8.26 and Washington Administrative Code (WAC) 468-100. For more information about WSDOT's policy and procedures, see Appendix C, Right-of-way Acquisition Process.

Views and Vegetation

Measures will be taken to preserve as much of the existing vegetation as possible and to plant new trees and shrubs in key areas along the roadway, in the roundabout, and around the detention ponds. WSDOT will develop a roadside restoration plan that will identify where vegetation may be replaced and emphasize the use of native species according to WSDOT Policy (WSDOT 2003). Where possible, vegetation will also be planted in the center median of the divided highway. These mitigation measures will help to screen the adjacent properties from light and glare of the roadway.

The color and texture of the new bridge will be designed to blend in with the surroundings to the extent possible. The new bridge will be designed to match the existing structure.

Stormwater

The stormwater treatment facilities built for the project will be designed according to the Highway Runoff Manual. The facilities will help protect water quality in the area and reduce

pollutants from the existing impervious surfaces that are currently untreated.

Fish and Streams

The project incorporates design features to help avoid and minimize impacts to fish, such as the use of retaining walls to minimize fill in critical areas and providing water quality treatment for new and existing pavement to prevent water quality degradation over time.

In cases where impacts cannot be avoided, WSDOT will mitigate for impacts to aquatic and riparian habitats, replacing the functions of the affected areas. This mitigation will occur within the project right-of-way or outside the right-of-way, or use a combination of both strategies.

For example, two culverts on fish-bearing streams that cross SR 522 will be upgraded to emulate natural channel conditions and improve fish access to 2,000 to 4,000 linear feet of useable habitat. The structures will also allow large debris to pass during storm events. Exhibit 2-10 depicts the location of these two culverts.

Mitigation to offset project-wide stream channel loss due to culvert extensions and pier placement will include additional culvert replacements or habitat enhancement within the Snohomish River or other streams. In addition, riparian areas within or outside of the project right-of-way will be enhanced to offset buffer impacts due to the project.

Wildlife and Wetlands

Habitat replacement for wetland losses will potentially occur on site, within the sub-basin of the project impacts, and/or off site but within the watershed. These improvements will provide benefits to wildlife species on a localized and/or watershed scale. The wildlife crossing, which is part of the proposed project, will provide a benefit.

The proposed wetland mitigation will comply with United States Army Corps of Engineers and Washington State Department of Ecology guidelines, and the applicable Snohomish County and City of Monroe Critical Areas

Regulations. WSDOT commits to “No Net Loss” under federal and state regulations and is required to replace wetland and buffer area and function at a minimum ratio of 1:1 (replacement area to impacted area). The goal of the proposed mitigation is to replace all chemical, physical, and biological functions lost as a result of this project at a large, high quality, sustainable wetland and aquatic site. Mitigation efforts will consist of restoring and enhancing a forested scrub-shrub, emergent, and aquatic bed floodplain wetland mosaic complex, and restoring riparian and upland forested habitats. The proposed mitigation will provide moderate to high levels for many wetland functions including water quality improvement, flood flow storage and attenuation, erosion control, food chain support, and specific (aquatic invertebrate, amphibian, wetland-associated mammal, wetland-associated bird, and fish) and general habitat.

Floodplains

Fill will be placed in the 100-year floodway fringe for the construction of the road and stormwater treatment facilities. Compensatory storage will be provided within the same basin in accordance with Snohomish County Code and the permits obtained for this project.